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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/397,188	09/16/1999	GORDON GRIGOR	0100.9900670	8413

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VEDDER PRICE KAUFMAN & KAMMHOLZ
222 N. LASALLE STREET
CHICAGO, IL 60601

EXAMINER

CHAUHAN, ULKA J

ART UNIT	PAPER NUMBER
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2676

DATE MAILED: 06/18/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

13

Office Action Summary

Application No.

09/397,188

Applicant(s)

GRIGOR ET AL.



Examiner

Ulka J. Chauhan

Art Unit

2676

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/3/03 has been entered.

Response to Amendment

2. Claims 1-20 are pending.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claim 1-15, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,850,232 to Engstrom et al.

6. As per claims 1, and 3-5, Engstrom teaches a method and system for flipping images in which an application requests the creation of a flipping structure including a memory region 126 serving as a front buffer and a memory region 132 serving as a back buffer at col. 7 lines 17-22 and lines 52-61. Engstrom discloses that during runtime, the application collects input (“receiving a rendering command”), processes it, and renders its display image to the back buffer of the flipping structure (“stored at a first memory location of a first frame buffer”) at col. 15 lines 27-43. Engstrom discloses that to avoid modifying surface memory that the display controller is reading, the display device interface checks the state of the display hardware before attempting operations that could cause a conflict by determining whether it is safe to change the address of the memory region that is currently serving as the front buffer at col. 20 lines 9-17. The scan line register is read to analyze the scan line position (“second memory location representative of a raster location”) relative to the position when the last flip occurred and if the scan line is less than the scan line at the time the last flip occurred, then it is safe to assume the previous flip operation has completed and the display address has been changed at col. 21 lines 28-33. Engstrom discloses that the display device interface supports flipping an image in a window using the support for overlays in the display controller within the video cards such as cards 70, 74, 1006, 1056 (“write behind controller in a video graphics adapter”) and that when the flip control determines that it is safe to update the display or overlay address, it executes steps 476-480 (“enabling storage... when the second memory location indicates the raster has accessed data”) at col. 6 lines 25-43, col. 22 lines 31-33 and Fig. 12B. Engstrom discloses that

Art Unit: 2676

the display device interface includes hardware abstraction layer that is integral to the display hardware within and/or coupled to the host computer at col. 4 lines 34-62. And Engstrom discloses that if the current position of the scan line is below the previous position, then the flip control proceeds by checking whether a refresh period has elapsed since the last flip request; if a refresh time has elapsed, it is safe to update the display address and if not, the flip control returns the "WasStillDrawing" error ("preventing storage... when the second memory location indicates the raster has not accessed data at the first memory location") at col. 22 lines 12-30 and Figs. 12A, B.

7. Engstrom discloses video cards such as cards 70, 74, 1006, 1056 but does not expressly teach a video graphics adapter. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have implemented the video card as video graphics adapter in order to support a defacto standard.

8. As per claim 2, Engstrom discloses that the computer 22 generally includes a CPU 28 that includes a control unit 36 for controlling the operation of computer system 20 in response to instructions from a computer program such as an application or an operating system at col. 3 lines 38-45.

9. As per claims 6 and 7, Engstrom discloses that the display device interface manages the application's access to the back buffer and also synchronizes the display controller's access to the front buffer. While the application renders its image to the back buffer of the flipping structure, the overlay control in the display hardware reads the image in the front buffer at col. 7 lines 17-25.

10. As per claim 8, Engstrom discloses that the display hardware 56 includes the hardware devices within and/or coupled to the host computer that are responsible for displaying visual data including 2D and 3D rendered graphics and animation, video, text and still images at col. 4 lines 59-62. Therefore Engstrom implicitly teaches graphics primitives having a first portion at X address location and a second portion at Y address location. Engstrom further discloses flipping to avoid tearing at col. 24 lines 24-56. Claims 8 and 9 are further similar in scope to claims 1-7 and are rejected under the same rationale.

11. As per claim 10, Engstrom does not expressly teach logical address locations. Official Notice is taken that both the concept and advantage of using logical addresses is well known and expected in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided for the use of logical addresses so that an application program can access memory locations in a system with virtual memory with intervening hardware and/or software mapping of the logical address to physical memory.

12. Claims 11, 12, and 17-20 are rejected per the rationale for claim 1 above, and further as Engstrom discloses that when the current scan line is not less than the last scan line at the last flip request, the flip control checks whether a refresh period has elapsed since the last flip request, if a refresh time has elapsed, it is safe to update the display address, and if not, the flip control returns an error at col. 22 lines 8-36. Therefore, Engstrom discloses that when current scan line is below the line of the last flip and a refresh period has not elapsed, then the display is still being refreshed and a flip operation is prohibited so that a portion adjacent to a portion that is stored in the back buffer is prevented from being stored in the back buffer if a flip occurred in between, and a refresh has not completed.

Art Unit: 2676

13. As per claims 13-15, Engstrom discloses that the video card receives image data and display commands from the host computer and controls the transfer of image data to a display monitor and the graphics controller is responsible for acceleration and other graphics operations at col. 5 lines 24-36. Engstrom also discloses that the display device interface acts as an interface to the display hardware such as the video cards and enables applications to access video memory and the special purpose graphics hardware to enhance performance at col. 6 lines 13-24. Engstrom further discloses that to avoid modifying surface memory that the display controller is reading, the display device interface checks the state of the display hardware before attempting operations that could cause a conflict by determining whether it is safe to change the address of the memory region that is currently serving as the front buffer at col. 20 lines 9-17. The scan line register is read to analyze the scan line position relative to the position when the last flip occurred and if the scan line is less than the scan line at the time the last flip occurred, then it is safe to assume the previous flip operation has completed and the display address has been changed at col. 21 lines 28-33. Engstrom discloses that when the flip control determines that it is safe to update the display or overlay address, it executes steps 476-480 at col. 22 lines 31-33 and Fig. 12B. And Engstrom discloses that if the current position of the scan line is below the previous position, then the flip control proceeds by checking whether a refresh period has elapsed since the last flip request; if a refresh time has elapsed, it is safe to update the display address and if not, the flip control returns the "WasStillDrawing" error at col. 22 lines 12-30 and Figs. 12A, B.

Allowable Subject Matter

14. Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. The following is a statement of reasons for the indication of allowable subject matter: the cited prior art does not disclose or render obvious the combination of elements recited in the claims. Specifically, the cited prior art fails to disclose or render obvious the particular structure of a write behind raster controller as recited in claim 16 and depicted in Fig. 5, having a multiplexer with two inputs and an output that is coupled to an input of a latch, which in turn outputs to an input of a comparator that compares it with a second input, and an incrementor that has two inputs including the output from the latch and that outputs to the first input of the multiplexer.

Response to Arguments

16. Applicant's arguments filed 6/3/03 have been fully considered but they are not persuasive. Applicant argues that Engstrom teaches a display device interface implemented as a software module executed by the CPU, whereas Applicant claims a write behind controller in a video graphics adapter. On the contrary, Engstrom discloses that the display device interface supports flipping an image using the support for overlays in the display controller within a video card such as 70, 74, 1006, and 1056. Engstrom further discloses that the display device interface includes hardware abstraction layer that is integral to the display hardware within and/or coupled to the host computer. Therefore Engstrom discloses using hardware in the video card to support flipping. Furthermore, Applicant admits that the write behind controller maybe in a video

Art Unit: 2676

graphics adapter or any other suitable device as disclosed in the specification on pg. 4 lines 19-29.

17. With respect to claims 8 and 9, Applicant argues that Engstrom does not describe how graphics primitives are provided to the graphics engine when the rendering engine is storing data to a frame buffer wherein the frame buffer is being accessed by a display device controller that is providing a current image. Claim 8 recites defining a primitive with address locations X and Y and providing it to the rendering engine. Claim 8 does not recite how graphics primitives are provided to the rendering engine. In response, it is noted that this feature is not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). And as noted previously, Engstrom discloses 2D and 3D rendered graphics and animation; therefore Engstrom implicitly teaches graphics primitives defined by address locations X and Y.

18. With respect to claim 10, Applicant requests citation of supporting reference for all elements in this claim. Official Notice was taken that both the concept and advantage of using logical addresses is well known and expected in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided for the use of logical addresses so that an application program can access memory locations in a system with virtual memory with intervening hardware and/or software mapping of the logical address to physical memory. In support that the subject matter of the Official Notice was well known in the art, U.S. Patent No. 6,205,531 to Hussain is provided as evidence. Hussain discloses "Modern computer systems typically provide some form of virtual memory environment. In an

Art Unit: 2676

environment of this type, application processes (and in some cases, system processes) access memory using virtual addresses. The computer system is responsible for translating these virtual addresses into physical addresses within the memory of the computer system. In a typical virtual memory environment, the virtual address space and the physical address space are both divided into fixed size pages. Each virtual address is a combination of a virtual page address and a page offset. Each physical address is a combination of a physical page address and a page offset. Using this system, page addresses may change during address translation, but page offsets remain the same. The computer system maintains a set of data structures, known as page tables, for each process. The page tables provide a per-process mapping between virtual page addresses and physical page addresses. Translation of a virtual address is accomplished by using the page table to find the physical page address that matches the virtual address being translated. The page offset portion of the virtual address being translated is then added to the physical page address to form the complete physical address”.

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Ulka Chauhan** whose telephone number is **(703) 305-9651**. The examiner can normally be reached Mon.-Fri. from 9:00 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Matthew Bella**, can be reached at **(703) 308-6829**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

Art Unit: 2676

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,
Arlington, VA, Sixth Floor (Receptionist).

20. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 305-4700.



Ulka J. Chauhan
Primary Examiner
Art Unit 2676

ujc
June 16, 2003